

31 October 2002
Application No.: 09/645,827
Docket: 1000.06

mechanically adjusts the optical components that have been attached to the optical bench. The preferred approach for doing this is the described plastic deformation alignment process.

The Office Action takes the "position that how the system operates is a process limitation that holds little patentable weight in an apparatus claim." Applicant respectfully notes, however, that little support in the law exists for assigning portions of the claims greater and lesser degrees of importance in terms of defining the invention. Instead, the touchstone for patentability is as articulated in the statutes, i.e., whether the claimed invention is new and non-obvious. Applicants respectfully request reconsideration of the claimed invention, as a whole, and consideration of these functional features. Moreover, even if "little patentable weight" is assigned to the process limitations, it still renders the claims new, avoiding the anticipation.

In an effort to have all aspects of the claims considered, new method claims are being submitted. These claims include 'attaching the optical components to the optical benches with the pick-and-place machine, characterizing positions of the optical components, which have been attached to the optical benches, and mechanically adjusting the relative positions of the optical components with an optical system aligner'. This is not shown or suggested by the applied reference.

Attached hereto is a marked-up version of the changes made to the specification by the instant amendments. The attached appendix is captioned "Version with Markings to Show Changes Made." Please note that due to the amendments, the page and line numbers may be different from the specification as originally filed.

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A favorable response in the form of a Notice of Allowance is respectfully solicited. Should any questions arise, the Examiner is encouraged to contact the undersigned attorney.

Respectfully submitted,

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CLAIMS

What is claimed is:

1. (twice amended) An optical system production line, comprising
an optical bench supply that provides optical benches;
a component supply that provides optical components;
a pick-and-place machine that receives optical benches from the bench supply,
picks optical components from the optical component supply, and attaches the
optical components to the optical benches; and
optical system aligner that characterizes the positions of the optical components,
which have been attached to the optical benches, and mechanically adjusts the
relative positions of the optical components.
2. An optical system production line as claimed in claim 1, wherein the pick-and-place machine secures the optical components to the bench by solder bonding.
3. (amended) An optical system production line as claimed in claim 1, wherein the optical system aligner characterizes the positions of the optical components by activating ~~an~~ optical links of the optical systems on the benches, detecting ~~an~~ optical signals after interaction with at least some of the optical components, and adjusting the optical components to optimize transmission of ~~the~~ optical signals over the links.
4. (amended) An optical system production line as claimed in claim 1, wherein the optical system aligner energizes ~~an~~ active components of the optical systems on the benches and adjusts the optical components to optimize optical signal transmission through the systems from the active optical components.

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5. (amended) An optical system production line as claimed in claim 1, wherein the optical system aligner energizes ~~an~~ active components ~~of the optical systems~~ and adjusts positions of at least one passive optical component in each of the optical systems to optimize optical signal transmission from the active components to the at least one passive component.

6. (amended) An optical system production line as claimed in claim 1, wherein the optical system aligner energizes ~~an~~ active components ~~of the optical systems~~ and adjusts positions of at least two passive optical components in each of the optical system to optimize optical signal transmission between the passive components.

7. An optical system production line as claimed in claim 1, wherein the pick and place machine is a flip-chip bonder.

8. (amended) An optical system production line as claimed in claim 1, wherein the optical system alignment system ~~alignment system~~ comprises two jaws for engaging a mounting structure supporting the optical component and moving the structure relative to the bench.

9. (new) An optical system production method, comprising
supplying optical benches from an optical bench supply;
supplying optical components from a component supply;
receiving optical components from the optical component supply and optical
benches from the optical bench supply at a pick-and-place machine;
attaching the optical components to the optical benches with the pick-and-place
machine;
characterizing positions of the optical components, which have been attached to the
optical benches; and
mechanically adjusting the relative positions of the optical components with an
optical system aligner.

10. (new) An optical system production method as claimed in claim 9, wherein the step of attaching the optical components to the optical benches with the pick-and-place machine comprises solder bonding the optical components to the optical benches.

11. (new) An optical system production method as claimed in claim 9, wherein the step of characterizing the positions of the optical components comprises:

the optical system aligner activating optical links of optical systems;

detecting optical signals after interaction with at least some of the optical

components; and

adjusting the optical components to optimize transmission of the optical signals in the optical systems.

12. (new) An optical system production method as claimed in claim 9, wherein the step of characterizing the positions of the optical components comprises:

energizing active components of optical systems; and

adjusting the optical components to optimize optical signal transmission through the optical systems from the active optical components.

13. (new) An optical system production method as claimed in claim 9, wherein the step of characterizing the positions of the optical components comprises:

energizing active components of optical systems; and

adjusting a position of at least one passive optical component in each of the optical systems to optimize optical signal transmission from the active components through the optical systems.

14. (new) An optical system production method as claimed in claim 9, wherein the step of characterizing the positions of the optical components comprises:

energizing active components of optical systems; and

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adjusting positions of at least two passive optical components in each of the optical systems to optimize optical signal transmission between the passive components.

15. (new) An optical system production method as claimed in claim 9, wherein the pick and place machine is a flip-chip bonder.

16. (new) An optical system production method as claimed in claim 9, wherein the step of mechanically adjusting the relative positions of the optical components comprises engaging mounting structures supporting the optical components and moving the structures relative to the optical benches with the optical system aligner.